

wafer mark (WM) is formed in a metal film 2 deposited on the wafer 1. The wafer mark is formed by forming recesses 2b in the metal film 2. The portions of the metal film 2 between the recesses 2b do not protrude upward from the surface of the metal film 2. Rather, the surface of the metal film 2 appears to be flat, except for the recesses 2b.

Conversely, Applicants' invention, as claimed in Claim 1, calls for the microdot mark to have a protrusion which protrudes in the center portion upward from the surface of the article to be marked. Nowhere does Ota et al. disclose or suggest that the wafer mark have a protrusion which protrudes in the center portion upward from the surface of the article to be marked. Furthermore, Applicants' invention, as claimed in Claim 1, calls for the length of each dot mark (in which each dot mark has a protrusion upward from the surface of the article to be marked) along the surface of the article to be marked to be 1.0 to 15.0 μm . Ota et al. does not disclose this claimed structure of a protruding mark. Rather, Ota et al. merely shows a pitch of 6 μm between recesses 2b. Ota et al. does not disclose or suggest a protruding dot mark having a length of 1.0 to 15.0 μm . Indeed, Ota et al. does not even pertain to the technology of Applicants' invention-protruding dot marks. Rather, Ota et al. pertains to forming recesses in a metal film to form alignment marks. Thus, Ota et al. does not anticipate Claim 1 of the present invention.

Regarding Applicants' Claim 7, Claim 7 further calls for the height of the protrusion to be 0.01 to 5.0 μm . Again, Ota et al. does not disclose or suggest a protrusion upward from the surface of the article to be marked. Accordingly, Ota et al. does not disclose or suggest a protrusion having a height of 0.01 to 5.0 μm .

Regarding Applicants' Claim 8, Claim 8 further calls for a periphery of the protrusion of the dot mark to be recessed. Because the wafer mark of Ota et al. does not have a protrusion, the Ota et al. wafer mark does not have a periphery of a protrusion that is recessed.

Regarding Applicants' Claim 10, Claim 10 further calls for the dot mark to be formed for product management or various securities. Conversely, Ota et al. pertains to an alignment apparatus which uses an alignment mark to align a wafer during processing. The Ota et al. alignment mark is not for product management or various securities.

Thus, Applicants respectfully submit that the § 102(b) rejection of Claims 1 and 7-10 has been overcome.

In Office Action paragraph 2, Claim 1 was rejected 35 U.S.C. § 102(e) as being anticipated by Stork et al., U.S. Patent Number 6,110,652. Applicants respectfully disagree. The present application claims priority based on Japanese Patent Application No. 11-333824 filed November 25, 1999 and Japanese Patent Application No. 10-334009 filed November 25, 1998. A certified copy of Japanese Patent Application No. 11-333824 has been submitted in this application, and a certified copy of Japanese Patent Application No. 10-334009 was submitted in the parent case, U.S. Serial No. 09/448,127. Enclosed is an English language translation of the 10-334009 priority document with a statement that the translation of the certified copy of the priority document is accurate. Accordingly, Applicants are entitled to rely on the November 25, 1998 filing date in Japan under 37 CFR § 1.55.

Stork et al. was filed in the United States Patent Office on December 11, 1998. Applicants' Japanese priority date of November 25, 1998 predates the § 102(e) prior art date of December 1, 1998 for Stork et al. Accordingly, Stork et al. is not prior art to the present invention.

Furthermore, Applicants respectfully submit that Stork et al. does not disclose or suggest a dot mark having a protrusion which protrudes in the center portion upward from the surface of the article to be marked. Conversely, Claim 1 of Applicants' invention claims such structure. Stork et al. is another reference which does not pertain to Applicants' protruding dot mark technology. Thus, Applicants respectfully submit that the § 102(e) rejection of Claim 1 has been overcome.

In Office Action paragraph 3, Claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ota et al. in view of Asakawa et al., DE 19810545 A1. Applicants respectfully disagree.

Claim 2 is dependant from Claim 1, and thus is allowable for the same reasons that independent Claim 1 is allowable. Furthermore, Asakawa et al. shows and describes a bar code and not a dot mark. Even further, Asakawa et al. does not disclose or suggest a dot mark having a protrusion.

Thus, Applicants respectfully submit that the § 103(a) rejection of Claim 2 has been overcome.

In Office Action paragraph 4, Claims 3-6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Komatsu, JPN 11-156563 in view of Azuma et al., U.S. Patent Number 4,861,620. Applicants respectfully disagree.

As discussed above, enclosed is an English language translation of priority document Japanese Application No. 10-334009 which was filed November 25, 1998 in Japan. Accordingly, Applicants are entitled to rely on the November 25, 1998 filing date in Japan. The Komatsu JPN 11-156563 reference has a publication date of June 15, 1999. Applicants' Japanese priority date of November 25, 1998 predates the June 15, 1999 publication date of Komatsu JPN 11-156563. Accordingly, Komatsu JPN 11-156563 is not prior art to the present application.

Thus, Applicants respectfully submit that the § 103(a) rejection of Claims 3-6 has been overcome.

In Office Action paragraph 5, Claims 3 and 6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over in den Baumen et al., U.S. Patent Number 5,676,866 in view of Yamazaki et al., U.S. Patent Number 5,821,497. Applicants respectfully disagree.

in den Baumen et al. pertains to an apparatus for laser machining with a plurality of beams. The in den Baumen et al. laser machining apparatus uses laser beams to bore holes through circuit boards. Conversely, Applicants' invention pertains to a method of forming a mark made by dots on the surface of an article to be marked. Nowhere does in den Baumen et al. disclose or suggest that a hole boring laser machining apparatus be used to form a mark made by dots on the surface of an article to be marked. Indeed, in den Baumen et al. does not even pertain to protruding dot mark technology. Accordingly, Applicants respectfully submit that there is no suggestion to combine the hole boring in den Baumen et al. patent with Yamazaki et al. which pertains to marking the surface of a workpiece to provide marking identification numbers, letters and the like.

Even if in den Baumen et al. and Yamazaki et al. are combined, the combination does not render Applicants' claimed invention obvious. For example, neither in den Baumen et al. or Yamazaki et al. disclose the step in Claim 3 of forming a desired pattern by driving and controlling a liquid crystal mask in which the maximum length of each pixel is 50 to 2000 μm and radiating the liquid crystal mask with the laser beam homogenized by the beam homogenizer. in den Baumen et al. does not even pertain to forming a dot mark. Furthermore,

the 50 μm dimension in column 9, line 45 of in den Baumen et al. pertains to the diameter of a hole formed in the workpiece and not the maximum length of a pixel in a liquid crystal mask. Also, Yamazaki et al. simply does not disclose or suggest the maximum length of each pixel to be 50 to 2000 μm . Even further, the hole forming apparatus in in den Baumen et al. does not utilize a liquid crystal mask, as claimed by Applicants.

Furthermore, according to the Yamazaki et al. patent, the energy distribution is not homogenized. Again, the maximum length of each pixel in the crystal mask is not defined.

Also, the in den Baumen et al. reference does not disclose or suggest that the hole forming technology be applied to forming marks made by dots on the surface of the article.

Thus, Applicants respectfully submit that in den Baumen et al. and Yamazaki et al. are not properly combinable. Furthermore, even if the two references are combined, the combination does not render Applicants' claimed invention obvious. Thus, Applicants respectfully submit that the § 103(a) rejection of Claims 3 and 6 has been overcome.

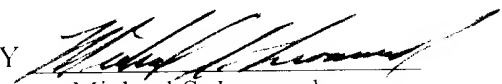
In Office Action paragraph 6, Claims 4 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over in den Baumen et al. in view of Yamazaki et al., and further in view of Lappalainen et al., U.S. Patent Number 5,632,916. Applicants respectfully disagree. Claims 4 and 5 depend from Claim 3, and thus are allowable for the same reasons that Claim 3 is allowable. Thus, Applicants respectfully submit that the § 103(a) rejection of Claims 4 and 5 has been overcome.

Applicants respectfully submit that all of the rejections have been overcome and request that a Notice of Allowance be issued for this case.

Respectfully submitted,

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